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Experimental analysis of re-shocked gas curtain DEVESH RANJAN, B.J. BALAKUMAR, GREG ORLICZ, KATHERINE PRESTRIDGE, CHRISTOPHER TOMKINS, Los Alamos National Laboratory, NM, USA-87545 — Results are presented from experiments studying the interaction of a planar shock wave of strength M ∼1.2 with a thin fluid layer of SF_6 gas imbedded in air. Flow visualizations are obtained using planar laser diagnostics (simultaneous PLIF/PIV measurements) rather than integral measures. A concurrent study at the lab has shown that the interaction of first shock wave with the thin fluid layer does not lead to a fully-developed turbulence stage, during the investigation window, for low-Mach number experiments. Therefore, this study is primarily focused on the turbulent mixing induced by the reshock of an already shocked interface. As the shock wave reflected from the end-wall of the test section passes through the already evolving SF_6 layer, the intense vortical and nonlinear acoustic phenomenon are observed, including dramatic changes in the length scales and topology of the evolving mushroom structures, intense mixing, and finally transition to the fully-turbulent stage characterized by fine scales in the flow field. The location of end-wall is changed during the experiments to achieve reshock of the interface at different times (different initial conditions).

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